

CLAIMS

We claim:

1. A washing machine for washing items using washing water without addition of a detergent by the user comprising:

a housing;

a washing tub for containing the items to be washed;

an outer tub for containing the washing tub;

a water supply device for supplying water into the washing tub;

an electrolyzed water-generating device connected with the water supply device for providing electrolyzed water;

a water level detecting means for detecting a level of water supplied into the washing tub; and,

a modifying agent feeding device for providing a modifying agent into the washing tub, wherein the modifying agent feeding device is connected with the water supply device, wherein the electrolyzed water-generating device provides electrolyzed water with a pH of at least 8.5, wherein the washing machine maintains the washing water pH in the range from 8.5 to 11, wherein the washing water electric conductivity is from 261 $\mu\text{S}/\text{cm}$ to 875 $\mu\text{S}/\text{cm}$, and wherein the washing water has a surface tension from 25 to 40 mN/m during washing operation.

2. The washing machine of claim 1, wherein the water supply device comprises:

a water supply tube for connection with a tap water source;

a water supply valve ;

a water supply port provided on the upper part of washing tub;

a first water supply path connecting the water supply valve and the water supply port;

and,

a second tap water supply tube connected to the output end of water supply valve, wherein the electrolytic water generating device and the modifying agent feeding device are positioned at the output end of the second tap water supply tube, and wherein the electrolytic water generating device comprises:

an electrolyzing cell having a plurality of diaphragms, a water inlet, a cathode chamber and an anode chamber;

a power supply converting device for converting alternating current into direct current (DC) to provide DC current to the electrolyzing cell wherein the water inlet of the electrolyzing cell is connected to the second tap water supply tube of the output end of the water supply valve, wherein the cathode chamber and the anode chamber of the electrolyzing cell are connected to a first drainpipe for providing electrolytic solution to the washing tub, and a second drainpipe connected to a water drainage tube, respectively, and wherein the modifying agent feeding device comprises:

a liquid storage container having a bottom;

a dosing and feeding device having an input end and a plurality of output ends, set at a lower part of the liquid storage container for providing modifying agent at a certain quantity, wherein the input end of the dosing and feeding device is connected with the liquid outlet tube at the bottom of the liquid storage container, wherein one output end of the dosing and feeding device is linked to the first drainpipe, and the other output end is connected with the water drainage tube and the second drainpipe through an emptying pipe.

3. The washing machine of claim 1, wherein the water supply device comprises:

a water supply tube for connection with a tap water source;

a water supply valve;

a water supply port provided on the upper part of washing tub;

a first water supply path connecting the water supply valve and the water supply port;

a second tap water supply tube connected to the output end of water supply valve;

and,

a third tap water supply tube connected with the output end of water supply valve, wherein the electrolytic water-generating device is set at the output end of the second tap water supply tube, and the modifying agent feeding device is connected with the output end of the third tap water supply tube, and wherein the electrolytic water generating device comprises:

an electrolyzing cell having a diaphragm, a water inlet, a cathode chamber and an anode chamber;

a power supply converting device for converting alternating current into direct current (DC) to provide DC current to the electrolyzing cell wherein the water inlet of the electrolyzing cell is connected to the second tap water supply tube of the output end of the water supply valve, wherein the cathode chamber and the anode chamber of the electrolyzing cell are connected to a first drainpipe for providing electrolytic solution to the washing tub,

and a second drainpipe connected to the water drainage tube, respectively, and wherein the modifying agent feeding device comprises:

a liquid storage container having a bottom;

a dosing and feeding device having an input end and a plurality of output ends, set at the lower part of the liquid storage container for supplying the modifying agent with rations, wherein one input end of the dosing and feeding device is connected with the liquid outlet tube at the bottom of the liquid storage container, and the other input end of the dosing and feeding device is connected with the third tap water supply tube of the water supply valve, wherein one output end of the dosing and feeding device is connected with the water supply port which is provided on the upper part of washing tub, and the other output end is connected with the water drainage tube and the second drainpipe through an emptying pipe.

4. A washing machine without addition of a detergent by the user comprising:

a housing;

a washing tub;

an electrolyzed water generating device having an electrolyzing cell, for providing electrolyzed water; and,

a modifying agent feeding device having a liquid storage container, for providing a modifying agent into the washing tub, wherein the electrolyzing cell of the electrolyzed water generating device, and/or the liquid storage container of the modifying agent feeding device is externally hung and mounted on the housing.

5. The washing machine of claim 4, wherein the electrolyzing cell and/or the liquid storage container is externally hung and mounted upon the lateral surface of a housing back of the washing machine.

6. The washing machine of claim 4, wherein a first perforation is provided at an upper part of a rear panel of the housing, for allowing a water supply tube of electrolyzed water to pass through the first perforation, and wherein a second perforation is provided at a lower part of the rear panel of the housing for allowing a second drainpipe to pass through the second perforation for connecting to a water drainage tube.

7. The washing machine of claim 4, wherein the electrolyzing cell and/or the liquid storage container has a thickness in the range from 1/10 to 1/4 of that of the washing machine, and wherein the electrolyzing cell and/or the liquid storage container has a width and height which are less than that of the washing machine.

8. The washing machine of claim 4, wherein the electrolyzing cell and/or the liquid storage container is covered with a covering board.
9. A method of washing items in a washing machine using a washing water and without using a detergent, comprising the steps of:
 - electrolyzing tap water and simultaneously adding a dosage of modifying agent, the washing water being the mixture solution of electrolyzed water and the modifying agent, wherein the pH of the washing water is maintained in the range from 8.5 to 11, wherein the electric conductivity of the washing water is from 261 $\mu\text{S}/\text{cm}$ to 875 $\mu\text{S}/\text{cm}$.
10. The method of claim 9 further comprising the step of maintaining the washing water pH in the range from 9 to 11.
11. The washing method of claim 9 further comprising the steps of:
 - supplying tap water to the electrolyzing cell for electrolyzing of the tap water, for generating acidic ionized water and alkaline ionized water respectively therefrom;
 - supplying alkaline water into the washing tub;
 - storing the acidic ionized water for sterilizing the items;
 - wherein the alkaline ionized water activated by the modifying agent fed by the modifying agent supply device reaches a washing water level;
 - starting normal washing; and,
 - performing a rinsing operation after water is supplied into the washing tub again, or a proper amount of acidic ionized water is introduced for rinsing the items; and supplying tap water to meet a predetermined water level.